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Preface

REGDOC-2.2.4, *Fitness for Duty, Volume III, Nuclear Security Officer Medical, Physical, and Psychological Fitness,* was developed to address key considerations for licensees of nuclear power plants and nuclear facilities, who will be providing Nuclear Security Officer (NSO) authorization under the *Nuclear Security Regulations*.

This regulatory document sets out the expectations of the Canadian Nuclear Safety Commission (CNSC) concerning minimum requirements for Nuclear Security Officer (NSO) medical, physical, and psychological certificates. This regulatory document applies to all persons whom the licensee is considering authorizing or has authorized to act as an NSO at a high-security site as defined in the *Nuclear Security Regulations*.

This regulatory document aligns with relevant international and national documents including:

1. *Recruitment, Qualification and Training of Personnel for Nuclear Power Plants* (International Atomic Energy Agency)

2. *Physical Abilities Requirement Evaluation* (Royal Canadian Mounted Police) and

3. *Personnel Licensing Procedures Manual* (Transport Canada).

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Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical and Psychological Fitness

1. Purpose

This regulatory document sets out the expectations of the Canadian Nuclear Safety Commission (CNSC) concerning minimum requirements for Nuclear Security Officer (NSO) medical, physical, and psychological certificates.

2. Scope

This regulatory document outlines the required documentation and necessary medical, physical, and psychological certification that a person must obtain before a licensee can authorize the person to act as an NSO. This regulatory document applies to all Nuclear Security Officers

3. Relevant Regulations

The provisions of the *Nuclear Security Regulations* relevant to this document include:

1. Subsection 18(2) of the *Nuclear Security Regulations*, which provides that, "Subject to section 18.6, no person shall act as a nuclear security officer without the recorded authorization of the licensee";
2. Section 18.2 of the *Nuclear Security Regulations*, which provides that, "A licensee, before issuing an authorization referred to in subsection 18(2) to a person referred to in that subsection, shall satisfy the conditions set out in section 18.1 in respect of the person—other than the condition set out in paragraph 17(2)(b)—and shall obtain from the person…

   (b) a certificate, signed by a duly qualified medical practitioner, certifying that the person does not have a medical condition that would prevent them from performing the tasks that are likely to be assigned by the licensee,
   (c) a certificate, signed by a fitness consultant recognized by the Canadian Society for Exercise Physiology or a person with equivalent or higher qualifications, certifying that the person is physically able to perform tasks that are likely to be assigned by the licensee, and
   (d) a certificate, signed by a duly qualified psychologist, certifying that the person is psychologically able to perform tasks that are likely to be assigned by the licensee";

3. Section 18.4 of the *Nuclear Security Regulations*, which provides that, "An authorization referred to in section 18 may be issued for any term not exceeding five years and shall be subject to any terms and conditions necessary to minimize the risk to the security of the facility";

4. Section 30 of the *Nuclear Security Regulations*, which provides that, "Every licensee shall at all times have available at a facility at which it carries on licensed activities a sufficient number of nuclear security officers to enable the licensee to comply with this Part and do the following:

(a) control the movement of persons, materials and land vehicles;
(b) conduct searches of persons, materials and land vehicles for weapons, explosive substances and Category I, II or III nuclear material;
(c) conduct preventive foot and land vehicle patrols of the facility and the perimeter of the protected area to inspect for security breaches and vulnerabilities;
(d) respond to and assess alarm incidents;
(e) apprehend and detain unarmed intruders;
(f) observe and report on the movements of armed intruders; and
(g) operate security equipment and systems."

4. Certificate Requirements

As per section 18.2 of the *Nuclear Security Regulations*, before authorizing a person to act as an NSO, the licensee shall obtain from the person medical, physical, and psychological certificates.

Medical, physical, and psychological certificates shall be retained by the licensee. The licensee must permit the CNSC to have access to the certificates for review, inspection, or audit purposes when required to do so.

4.1 Medical Certificate

A medical assessment shall be undertaken to determine whether the person, from a medical perspective, is capable of performing the tasks that are likely to be assigned by the licensee and as such does not pose a risk to his or her own safety, the safety of others, or the facility.

The medical assessment shall include medical examination(s), vision test(s), and hearing test(s). The duly qualified medical practitioner shall determine the medical examination(s), vision test(s), and hearing test(s) to be used in the medical assessment.

When conducting the medical assessment, the medical practitioner may be guided by:

1. *Police health: A physician's gaide for the assessment of police officers* [1];
2. Ontario Association of Chiefs of Police document titled *Constable Selection System: Guidelines for Examining Physicians – Medical Evaluation of Police Constable Applicants* [2];
3. Ontario Association of Chiefs of Police document titled *Constable Selection System: Guidelines for Examining Ophthalmologists / Optometrists [3];*
4. Ontario Association of Chiefs of Police document titled *Constable Selection System: Hearing Performance Standard* [4]; and
5. Other equivalent recognized guidelines for policing within the province of employment.

Subsequent to the medical assessment, a certificate, signed by a duly qualified medical practitioner, will certify that the person is medically capable of safely performing the tasks that are likely to be assigned by the licensee.

An NSO shall undergo the described medical assessment at least every two years.

The licensee is responsible for retaining medical certificates.

4.2 Physical Certificate

A physical fitness test shall be undertaken to determine whether the person, from a physical perspective, is capable of performing the tasks that are likely to be assigned by the licensee and as such does not pose a risk to his or her own safety, the safety of others, or the facility.

The physical fitness test shall be the CNSC-approved NSO Physical Fitness Test found in Appendix A, or equivalent. The physical fitness test shall be administered by a fitness consultant recognized by the Canadian Society for Exercise Physiology, or a person with equivalent or higher qualifications.

Subsequent to passing the physical fitness test, a certificate, signed by a fitness consultant recognized by the Canadian Society for Exercise Physiology or a person with equivalent or higher qualifications, will certify that the person is physically capable of safely performing the tasks that are likely to be assigned by the licensee.

An NSO shall undergo a physical fitness test every twelve months.

The licensee is responsible for retaining physical certificates.

4.3 Psychological Certificate

A psychological assessment shall be undertaken to determine whether the person from a psychological perspective, is capable of performing the tasks that are likely to be assigned by the licensee and as such does not pose a risk to his or her own safety, the safety of others, or the facility.

The psychological assessment shall include an interview and test(s). A duly qualified psychologist shall determine the interview and test(s) to use in the assessment. The interview and test(s), along with their interpretation, shall be conducted by the psychologist.

Subsequent to the psychological assessment, a certificate, signed by a duly qualified psychologist, will certify that the person is psychologically capable of safely performing the tasks that are likely to be assigned by the licensee.

The licensee is responsible for retaining psychological certificates.

5. Special Circumstances

NSO certificate requirements represent reasonable occupational and operational requirements for an NSO in the execution of their duties at high-security sites. Where a person obtains and maintains NSO certificate(s), the licensee may authorize the person to act as an NSO. The employer is responsible to assess the extent, where considered necessary, of the duty to accommodate. The licensee is also responsible to ensure that any duties assigned to a person do not pose a risk to his or her own health or safety, the health or safety of others, the safety of the facility, and do not impact the operational effectiveness of the licensee's operation.

Appendix A: Canadian Nuclear Security Fitness Test (CNSFT)

A.1 Background

Physiology is the identification of physiological mechanisms underlying physical activity, thereby enabling comprehensive delivery of treatment services concerned with the analysis, improvement, and maintenance of health and fitness. The Canadian Society for Exercise Physiology is a voluntary organization composed of professionals involved in the scientific study of exercise physiology, exercise biochemistry, fitness, and health. The Canadian Society for Exercise Physiology (then known as the Canadian Association of Sport Sciences), was founded at the 1967 Pan American Games, in Winnipeg, Manitoba , the result of four years of cooperative efforts by the Canadian Medical Association and the Canadian Association for Health, Physical Education, Recreation and Dance.

A physical fitness assessment is a snapshot of a person's current physical fitness level. The Canadian Society for Exercise Physiology sets national standards of practice required for validity, accuracy, and reliability in physical fitness assessments. These standards must be met in order for an organization to be designated as an Accredited Fitness Appraisal Centre (AFAC). This designation demonstrates meeting required criteria for direct physiological exercise assessments, thereby ensuring accurate, valid, and reliable data.

A.2 Objectives

The physical fitness test is designed to assess the following:

1. static balance in three planes of motion, proprioception, and flexibility
2. base aerobic fitness and agility, middle aerobic fitness
3. core strength, grip strength and force discrimination

A.3 Test

This physical fitness test involves a series of stations, as described below. In order to pass the physical fitness test, the individual must obtain a pass mark at each station. The individual must complete each station in the order they appear below. If the individual fails to pass any station, the entire test must be repeated.

Station 1 – Search Station

Station 1 is a series of five traffic cones (28-inch pylons) set in line with a 60.96-cm (2-ft) separation between each cone. A symbol (or shape or other identifiable item) measuring about 21 cm (8 in.) is concealed by the bottom of the cone. The individual is given the following instructions:

At the first cone, raise both arms overhead, go up on tiptoes and hold the position for two seconds. Return to your original stance. Stand at arm's length from cone, lower into a squat position, tip the cone and report the symbol seen. Return the cone to its original position, stand up and return to the start position.

Move to the second cone, stand at arm's length with the cone to your left, and lower your body until the hand contacts the top of the cone. Tip the cone with one hand and report the symbol seen. Return the cone to its original position, stand up and return to the start position.

Move to the third cone, stand at arm's length with the cone to your left, and lower your body while twisting until the right hand contacts the top of the cone. Tip the cone with one hand on one of the cone's edges and report the symbol seen. Return the cone to its original position, stand up and return to the start position.

Move to the fourth cone, stand at arm's length with the cone to your right, and lower your body while twisting until the left hand contacts the top of the cone. Tip the cone onto one edge of the cone with one hand and report the symbol seen Return the cone to its original position, stand up and return to the start position.

Move to the fifth cone, stand at arm's length with the cone to your right, and lower your body until the right hand contacts the top of the cone. Tip the cone on to one of its edges with one hand and report the symbol seen. Return the cone to its original position, stand up and return to the start position.

Return to the first cone wearing a 9-kg (19.8-lb) vest. Perform the above station 1 series again, while wearing the vest.

This vest will be worn for all subsequent stations in the test.

Station 1 – Pass mark

The individual must complete station 1 with no faults permitted. Faults are defined as: losing balance or falling, taking a step (*feet may rotate), not tipping the pylon on one of the four edges, two errors in reporting numbers on the same movement. This station is not timed.

Station 2A – Speed walk station

Station 2A is a series of speed walks conducted around a rectangular perimeter with 13.72 m (45 ft.) sides and 13.72 m (45 ft.) ends, demarcated by perimeter tape circumscribing the perimeter at a 1.22-m (4-ft.) height. The individual is given the following instructions:

At the command "Go", walk clockwise around the circuit at sufficient speed to complete the circuit around the perimeter in less than 37 seconds while under control and without touching the perimeter boundary line. Upon return to the start point, rest for 10 seconds.

This circuit is then repeated 11.25 more times (total distance of 2205 ft.) in less than 37 seconds per circuit, with a 10-second rest permitted after each lap. Each alternate lap is to be conducted counter-clockwise.

5.7.1.1 Station 2A – Pass mark

The individual must complete station 2A in the prescribed time and without any faults. Faults are defined as: tripping, falling or striking the perimeter tape or the tape support at the corners, or not completing the circuit in less than 37 seconds.

5.7.1.2 Station 2B – Stair climb station

Station 2B is a series of stair climbs and descents on a stairway with a vertical rise of continuous stairs (See the stair matrix below). The individual is given the following instructions:

At the command "Go", climb the stairs using the same size step (one or two stairs at a time) throughout the climb using the railing if desired, until reaching the top. Turnabout and immediately descend the stairs under control to the start point. Time for the climb and descent is 30 seconds. Any time remaining once the NSO has completed the descent is used for rest before commencing the next ascent.

5.7.1.3 Station 2B – Pass mark

The individual must complete station 2B in the prescribed time and without any faults. Faults are defined as: tripping, falling, or not completing the climb and descent in less than 30 seconds.

5.7.1.4 Station 3 – Lift/carry for control station

Station 3 involves a series of movements of a 34.07-litre (36-qt) container loaded with an unstable weight load (water) of 12.3 kg (27 lbs) contained freely within the container. The individual stands facing a 1.83 x by 0.91 m (6 x 3 ft.) table, with the waist touching the table edge. The table is circumscribed by a 0.91 m (3 ft.) border outward from the table. The original position of the container is marked on the table with a rectangular border area 2.54 cm (1 in.) larger on each side in comparison to the container.

The individual is given the following instructions:

Lift the container until it is in contact with your chest. Move to the end of the table, keeping the container in contact with your chest. Tilt the container right 30 degrees and return it to the center balanced position.

Keeping the container in contact with your chest, move to the opposite end of the table. Tilt the container left 30 degrees and return it to the centre balanced position.

Keeping the container in contact with your chest, move to the original start position and place the container back in its original position.

5.7.1.5 Station 3 – Pass mark

The individual must complete Station 3with no faults permitted. Faults are defined as: dropping the container, losing control of the container as evidenced by the need to re grip the container, failure to maintain the container in contact with the chest while walking, or contacting the station perimeter markers.

The test for the NSO is complete at this point.

STAIR MATRIX for Station 2B- Fig. 1.1

Site	Stairs (#)	Height/Stair (in)	Repeats (#)	Faults	Time Standard (+ 0.2 sec Timing Standard)
CNL (NSO)	12	8	10 + 6	0	30 or less/repeat
Gentilly-2 (NSO)	10	7.5	13 + 4	0	30 or less/repeat
P. Lepreau (NSO)	8	9	14 + 0	0	30 or less/repeat
OPG (NSO)	14	6.75	10 + 10	0	30 or less/repeat
Bruce (NSO)	12	7	12 + 0	0	30 or less/repeat

Note: Any additional steps to obtain the total required distance are untimed; only the repeats are timed

Note: The total height of the stair climb, which is the sum of height climbed on each repeat times the number of repeats, is the same (within 2%) regardless of the height of the stairs within the 7-9 in range

Note: Total vertical climb is 1008 in. If stairs are not uniform, measure each stair and follow the example below to get the required number of repeats and additional stairs to get the required climb within 2%

E.g., 7.5 in stairs and 12 stairs = 7.5 x 12 = 90 vertical inches per climb

1008 / 90 = 11.2 or 11 repeats and 20% of 12 stairs = 2 additional stairs (within

0.03% of range)

Glossary

For definitions of terms used in this document, see REGDOC-3.6, *Glossary of CNSC Terminology*.

REGDOC-3.6 includes terms and definitions used in the *Nuclear Safety and Control Act* (NSCA), the regulations made under the NSCA, and CNSC regulatory documents and other publications. REGDOC-3.6 is provided for reference and information.

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1. Trottier and J. Brown, *Police Health: Physician's Guide for the Assessment of Police Officers*, Canada Communication Group, 1994. Ottawa

2. Ontario Association of Chiefs of Police, *Constable Selection System: Guidelines for Examining Physicians – Medical Evaluation of Police Constable Applicants*, Ontario Association of Chiefs of Police, 2006. Toronto.

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4. Ontario Association of Chiefs of Police, *Constable Selection System: Hearing Performance Standard*, Ontario Association of Chiefs of Police, 2006. Toronto.

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6. Royal Canadian Mounted Police, *Physical Abilities Requirement Evaluation (PARE)*, 2007. Ottawa.

7. Transport Canada, *TP 2943, Personnel Licensing Procedures Manual*, 2006. Ottawa.

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Facilities and activities within the nuclear sector in Canada are regulated by the Canadian Nuclear Safety Commission (CNSC). In addition to the *Nuclear Safety and Control Act* and associated regulations, these facilities and activities may also be required to comply with other regulatory instruments such as regulatory documents or standards.

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